



UHAMKA PRESS

p-ISSN: 2477-3859 e-ISSN: 2477-3581
JURNAL INOVASI PENDIDIKAN DASAR
The Journal of Innovation in Elementary Education
<http://jipd.uhamka.ac.id>



Volume 4 • Number 2 • June 2019 • 71 - 76

The Need of Assessment Instruments to Measuring the Higher-Order Thinking Skills in Accordance to The Elementary School Students' Development

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Received: March 6, 2019

Accepted: May 26, 2019

Published: June 3, 2019

Abstract

In the 21st century, it was required critical thinking generation which was able to solve problems and actively participate in making decisions on local and global issues that were formed through the thinking process. The research objectives were describing the questions form that are often used teachers, and the teacher's need for assessment instruments to measure Higher-Order Thinking Skills (HOTS) that were appropriated to the level of elementary school students' development. This was a qualitative descriptive research with a case research method. The research samples were 34 elementary school teachers in Surakarta, Central Java, Indonesia. Informant selection used snow-ball sampling technique, while the research data are elementary teachers and documents. Data collection techniques were in-depth interviews, questionnaires, and document analysis. Data validity used source and technical triangulations. Data analysis used interactive analysis techniques including of (1) data collection, (2) data reduction, (3) data presentation, and (4) conclusion. The findings showed that (1) the description questions form are most frequently used teacher and multiple choice questions only measured C1 to C4; (2) 48% of teachers needed assessment instruments that can be used to measure HOTS.

Keywords: Assessment, elementary school, HOTS

Kebutuhan Instrumen Penilaian untuk Mengukur Keterampilan Berpikir Tingkat Tinggi sesuai dengan Perkembangan Siswa Sekolah Dasar

Abstrak

Abad 21 diperlukan pemikir kritis dan mampu memecahkan masalah dan secara aktif berpartisipasi dalam membuat keputusan tentang isu-isu lokal dan global yang terbentuk melalui proses berpikir. Tujuan penelitian adalah untuk menjelaskan bentuk pertanyaan yang sering digunakan guru dan kebutuhan instrumen penilaian yang digunakan guru untuk mengukur Keterampilan Berpikir Tingkat Tinggi (HOTS) yang disesuaikan dengan tingkat perkembangan siswa sekolah dasar. Penelitian ini adalah deskriptif kualitatif dengan metode studi kasus. Sampel penelitian adalah 34 guru sekolah dasar di Surakarta, Jawa Tengah, Indonesia. Pemilihan sampel menggunakan teknik snow-ball sampling, sedangkan sumber data penelitian adalah guru dan dokumen dasar. Teknik pengumpulan data adalah wawancara mendalam, kuesioner, dan analisis dokumen. Validitas data menggunakan triangulasi sumber dan teknis. Analisis data menggunakan teknik analisis interaktif termasuk (1) pengumpulan data, (2) reduksi data, (3) penyajian data, dan (4) kesimpulan. Temuan penelitian termasuk (1) bentuk pertanyaan deskripsi yang paling sering digunakan guru dan pertanyaan pilihan ganda hanya mengukur C1 ke C4; (2) 48% guru membutuhkan instrumen penilaian yang dapat digunakan untuk mengukur HOTS.

Kata kunci: Asesmen, HOTS, Sekolah Dasar

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INTRODUCTION

The expected outcome of the learning process in the 21st century is individuals have life and career skills that is the ability to synthesize information, work as a team, manage widely and complexly, and to be responsible to the community and the environment (Leward and Hirata, 2011). The 21st century was required a critical thinking generation and able to solve problems and actively participate in making decisions on local and global issues that are formed through the thinking process (Silva, 2009).

The Program International Students Assessment (PISA) as a program was implemented OECD has conducted research to look at students' literacy skills, math, science, and reading in various countries including Indonesia. The PISA results were shown that Indonesian students' scientific literacy abilities are ranked 63 of the 64 participating countries, with a score of 382 which is far from the average of 494 (OECD, 2014).

Based on the analysis of National Accreditation Board (BSNP, 2018) which examined the schools needed were implemented based on eight Education National Standards which include content standards, process standards, graduated competency standards, education standards and education personnel, facilities and infrastructure, management, financing, and assessment standards, stated that there are still weaknesses in meeting the assessment standards at school. This was evident from the formative evaluation instruments that can only measure low order thinking abilities. The low quality of education, including the learning outcomes achieved as mentioned above can be caused by various factors, including the characteristics of subjects, students, and teachers (Duskri, et al, 2014).

Based on field observations and the results of research observations in elementary schools that are used to practice field experience in 2017, teachers still tend to use the description test model. In some places, it is even easy to find a collection of questions, even though the question is not yet standard or suitable for use. The teacher also used test instruments that are traded on the free market, although the test instruments are not good, and not in accordance with the required competencies in the curriculum and most only assess low-order thinking skills, namely the ability in the C1 to C3 domains.

Anderson & Krathwohl (2010) and Airasian & Miranda (2002) explained that the thinking process was divided into two types including of low-order thinking skills that is the think ability to in C1-C3 domain, and high-order thinking skills that is the thinking ability in the C4-C6 domain. Higher-order thinking skills were provided the right direction in thinking and helps in determining the relevance of others in a more accurate manner.

Therefore critical thinking skills are needed in solving or finding solutions to problems. Higher Order Thinking Skills (HOTS) is the thinking ability is not only keep in mind (recall), restate, or refer without processing (recite). As revealed by Kings (2010) that higher order thinking skills were included of critical, logical, reflective, metacognitive, and creative thinking. The success of the application of these skills can be seen from the students' ability to explore, make decisions, performance results and products that are valid in the context of experience learning that encourages the growth of high-order thinking skills in accordance with intellectual skills.

Assessment to measure higher order thinking skills is not fully mastered by the teachers, so the teacher cannot clearly map the profile of students' higher order thinking skills. Even though, one of the teacher's competencies is to compile an assessment instrument because the assessment can be used to measure the success of the achievement of the learning indicators (Arikunto, 2015). Based on the interviews results, acquired the findings of (1) the formative tests instruments in elementary school were the description and short answers; (2) teachers still have difficulties in making valid multiple choice questions; (3) teachers still have limitations in preparing test instruments to measure higher Order thinking skills in accordance to the students' development.

Based on the above findings it can be said that elementary teachers need assessment instruments to measure higher Order thinking skills in accordance to the students' development. Similarly, [BSNP \(2018\)](#) was stated that the assessment that leads to HOTS needs to be balanced with the teacher's ability to compile HOTS questions, so that in-house training programs for teachers need to be intensified. Therefore, the research purposes were (1) described the assessment instruments that are still used by elementary school teachers; (2) described the teacher's need for assessment instrument that can be used to measure higher order thinking skills in accordance to the elementary school students' development.

METHODS

This research was carried out in elementary school of Surakarta, Central Java, Indonesia. This research carried out in six months from February to August 2018. This research is a descriptive study with a qualitative approach. [Sukardi \(2011\)](#) stated that descriptive research is a research to get a systematic overview and describe the characteristics of the research object appropriately.

This study was carried out with a case study method because this study found data in the form of statements about the causes of anxiety for elementary school teachers to obtain assessment instruments that can be used to measure higher-order thinking skills in accordance to the development of elementary school students. This is a single case study based on the consideration that the case study only highlights one case character. That is, the case is about the teacher's need for assessment instruments to measure higher-order thinking skills in accordance to the elementary school students.

The research samples were 34 elementary school teachers in Surakarta, Central Java, Indonesia. Informant selection was used snow-ball sampling technique, while the research data are elementary teachers and documents. Data collection techniques were in-depth interviews, questionnaires, and document analysis. Data validity was used source and technical triangulations. Data analysis was used interactive analysis techniques including of (1) data collection, (2) data reduction, (3) data presentation, and (4) conclusion

FINDINGS AND DISCUSSION

Based on the results of in-depth interviews, questionnaires, and document analysis can be presented that the question most often teachers used is description question, especially in practice questions and daily tests. The question was chosen because the teacher assumed that the description question was easy in the process of making it. Based on the analysis of the assessment document, the results can be explained as follows:

1. The elementary schools teachers used tests types of 38% of short answers questions, 30% of description questions, 25% of multiple choice questions, 3% of true-false questions, 3% matching questions, and 1% other type of questions.
2. The mapping of cognitive domains in the teacher's question bank was about 30% of remembering domain, 25% of understanding domain, 15% of application domain, 13% of analyzing domain, 11% of evaluation domain, and 3% of creation domain.
3. Mapping the cognitive domain in the National Examination, Final Semester Examination, and Mid Semester Examination in 2015 and 2016 are as follows:
 - a. The academic year of 2015/2016, 40% questions C1, 32% questions C2, 12% questions C3, 16% questions C4, C5 and C6 were still 0%.
 - b. The academic year of 2016/2017, 44% questions C1, 40% questions C2, 6% questions C3, 10% questions C4, C5 and C6 were still 0%.
 - c. The academic year of 2017/2018 the National Examination questions have included the C5 and C6 questions, but the grades of elementary school students in the academic 2017/2018 have decreased.

Based on the results of the questionnaire, it turned out that the teachers had carried out an assessment to measure HOTS, but only 52%. Of the 52%, 17% of respondents used the description test, 13% used the project test, and the rest did not specify the type of assessment they used to measure HOTS. In measuring students' abilities, especially in the cognitive domain, teachers still rely on question from Final Semester Examination, Mid Semester Examination, printed books questions, and Students Task Sheet. Although there were already assessment guidelines issued by the Directorate General of Primary and Secondary Education and some of the training followed by the teacher, the teacher acknowledged that in the assessment process in the classroom, all students' abilities cannot be fully measured and well-mapped. New teachers can measure students' abilities in remembering, memorizing, and understanding several phenomena related to learning material. Teachers recognize that they do not fully understand and can apply assessment to measure higher order thinking skills.

Effective questions are question that valid, reliable, and the deceptive well-function. To achieve these assumptions, many processes must be passed by the teacher. This was also the problem teacher, because they had difficulty making options in effective multiple choice questions. In addition, the teacher also said that multiple choice questions can be guessed or students answered carelessly, so that they cannot fully know the students' actual abilities. However, teachers recognized that multiple choice questions had several advantages. Thus it can be said that many teachers still had difficulties in making effective multiple choice questions to measure HOTS.

Measurement of high-order thinking skills required clear and valid assessment instruments, but test instruments for measuring higher-order thinking skills have not been developed by education practitioners. Assessments in the schools were provided little opportunity for students to develop deeper knowledge (Cullinane, 2010).

Assessments that have been applied by teachers, especially in the cognitive domain with new multiple choice tests can measure levels of C1 to C4. Therefore, the teacher really needed examples of assessment instruments that can measure high-order thinking skills.

Information of research results also shown that the teacher's awareness to the importance of HOTS already exists, but the assessment instruments for measuring HOTS have not been fully mastered by the teachers. This results in a description question only measured LOTS that is often used by teachers. This was in accordance with the rational semantic relationship theory that X is the reason for doing Y. Besides that, it is also in line with the causal semantic theory that X is the cause of Y.

Based on the results of interviews, questionnaires, and document analysis, it can be revealed that teachers still have difficulty making multiple choice questions to measure HOTS because teachers have not fully understood and applied the assessment to measure HOTS. In addition, data also shown that half of the respondents have not measured students' HOTS abilities. This could be due to the lack of teacher's experience in applying HOTS-oriented learning and the lack of teacher's knowledge regarding assessments that measure HOTS in accordance with the development of elementary students. On the other hand, the follow-up of student learning outcomes that HOTS assesses, had also not been a priority in summative assessments conducted by the local Education Agency, although in the curriculum it has been stated that 80% of assessments must include high-order thinking skills (Education and Culture Ministry, 2013 in BNSP, 2018).

The teachers still had trouble making multiple choice questions to measure HOTS, and the teacher had not fully understood and applied the assessment to measure HOTS, so the teachers should be given training in the preparation of an assessment to measure HOTS. This was in accordance to the results of Abdullah's research, et al (2017) teacher who takes HOTS courses, have a profound impact on the level of knowledge and

application of HOTS. Therefore, courses or training on knowledge and implementation of HOTS must continue to be carried out for teachers to keep abreast of changes and improvements in implementing HOTS learning, knowledge and skills in teaching in elementary schools in order to become professional teachers. This was in accordance to the Shukla & Dugsungnoen (2016) that professional, qualified and experienced teachers correlated significantly with the strategies used to instill high-order thinking skill.

CONCLUSION

The research results and discussion were shown that the description questions are the most frequently teacher used. Problems that refer to the cognitive domain, especially multiple choice tests only measure C1 to C4. This is because of the limitations and difficulties of the teacher to make effective multiple choice questions. As many as 48% of teachers needed assessment instruments that can measure a wide range of material, can fulfill the proportion of items that can measure indicators of students' high-order thinking skills (analyzing, evaluating, and creating), have small opportunities for students to guess answers, and can be analyzed/processed easily, both as diagnostic, formative and summative test instruments, and in accordance with the level of students' development.

REFERENCES

- Abdullah, Abdul Halim; Mokhtar, Mahani; Halim, Noor Dayana Abd; Ali, Dayana Farzeeha; Tahir, Lokman Mohd; Kohar, U. H. A. (2017). Mathematics Teachers' Level of Knowledge and Practice on the Implementation of Higher-Order Thinking Skills (HOTS). *EURASIA Journal of Mathematics, Science and Technology Education*, 13(1), 3-17. <https://doi.org/10.12973/eurasia.2017.00601a>
- Anderson, L.W. & Krathwahl, D.R. (2010). *A Taxonomy for Learning Teaching and Assessing: A Revision of Bloom's Taxonomy of Education Objectives*. New York: Addison Wesley Longman, Inc.
- Arikunto, S. (2015). *Dasar-dasar Evaluasi Pendidikan*. Jakarta: Bumi Aksara.
- BSNP. (2018). Kebijakan Pendidikan Berbasis Standar. Makalah Seminar Nasional "Strategi Pengembangan Pendidikan di Era Desrupsi". Surakarta, 9 Mei 2018.
- Cullinane, A & Meave L. (2010). *Two-Tier Multiple Choice Question: An Alternative Methods of Formative Assessment for First Year Undergraduate Biology Students*. Limerick: National Center for Excellence in Mathematics and Education Science Teaching and Learning (NCFE - MSTL).
- Duskri, M. Kumaidi, dan Suryanto. (2014). Pengembangan Tes Diagnostik Kesulitan Belajar Matematika SD. *Jurnal Penelitian dan Evaluasi Pendidikan*, 18 (1) 44-56.
- Hamilton, D. (1980). Some Contasting Assumption about Case Study Research and Survey Analysis. *Journal of Center for Applied Research in Education*, Vol. XII(2), 76-92.
- Kings, dkk. *Higher Order Thinking Skills: Definition, Teaching Strategies, and Assessment*. Retrieved from www.caa.fsu.edu/files/higher-orderthinkingskills.pdf.
- Leward, BC. & Hirata, D. (2011). *An Overview of 21st Century Skills, Summary of 21st Century Skills for Students and Etacher by Pasific Policy Resarch Center*. Honolulu: Kamehameha Schools Research & Evaluation.
- OECD. (2012). *PISA 2012 Results in Focus: "What 15 Year Olds Know and What They Can Do With What They Know"* Paris : Directorate for Education and Skills OECD. Retrieved from www.oecd.org/edu.

- Shukla, D & Dungsungnoen. (2016). Students' Perceived Level and Teacher's Teaching Strategies of Higher Order Thinking Skills: A Study on Higher Educational Institutions in Thailand. *Journal of Education and Practice*, v7 n12 p211-219.
- Silva, E. (2009). Measuring Skill for 21th Century Learning. *Phi Delta Kappan*, 90 (9) 630-631.
- Sukardi. (2011). *Metodologi Penelitian Pendidikan*. Jakarta: Bumi Aksara.